

## CLAIMS

1. Charged particle beam device, comprising
  - 5 a charged particle emitter (2) for emitting a primary charged particle beam (12);
  - a deflection system, comprising three deflection stages (14; 21; 72), whereby the deflection system is arranged for deflecting the primary charged particle beam and specimen-released charged particles along a first or a second beam path (12a, 12b);
  - 10 two detection units (16; 44), each associated with one of the first or second beam path, so that the deflection system is adapted to switch between the two detection units;
  - whereby one of the three deflection stages (14) is closer to a specimen stage (6) than the two detection units (16).
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2. The charged particle beam device according to claim 1, further comprising an aperture unit (15; 112) for shaping the charged particle beam.
- 20 3. The charged particle beam device according to claim 2,
  - whereby the aperture unit (15; 41; 112) is a multi-aperture unit (15; 41) comprising two apertures (51; 42, 43);
  - whereby each aperture of the two apertures is associated with one of the first or second beam path so that the deflection system is adapted to switch
  - 25 between the two apertures and a corresponding detection unit of the two detection units.
- 30 4. The charged particle beam device according to any of the preceding claims, the deflection system comprising six dipole deflectors (14; 21; 72), whereby the deflection system is arranged for deflecting the primary

charged particle beam and the specimen-released charged particles in two dimensions (x,y).

- 5 5. The charged particle beam device according to claim 4, whereby each of the three deflection stages comprises two of the six dipole deflectors.
6. The charged particle beam device according to any of the preceding claims, whereby each of the three deflection stages comprises a magnetic deflection component.
- 10 7. The charged particle beam device according to any of the preceding claims, whereby the two detection units are similar and the two apertures are similar.
- 15 8. The charged particle beam device according to any of claims 2 to 6, whereby the two detection units (16, 44) are different and the two apertures (42, 43) are different.
- 20 9. The charged particle beam device according to any of the preceding claims, comprising six detection units (16, 44) and six apertures (42, 43), whereby three detection units (16, 44) and three apertures (43, 43) are similar.
- 25 10. The charged particle beam device according to any of the preceding claims, whereby a primary beam deflection angle (18a) and a specimen-released charged particles deflection angle (18b) are different.
11. The charged particle beam device according to any of the preceding claims, further comprising a mirror unit (32)

12. The charged particle beam device according to any of claims 1 to 8, whereby a primary beam deflection angle (88) and a specimen-released charged particles deflection angle (88) are substantially the same.
- 5 13. The charged particle beam device according to any of the preceding claims, whereby the apertures are arranged in a first sector area (96) and the detection units are arranged in a second sector area (95), and whereby the first and the second sector areas do not overlap.
- 10 14. The charged particle beam device according to any of the preceding claims, whereby the three deflection stages are arranged symmetrically to a plane substantially orthogonal to the optical axis (11).
15. Method of imaging a specimen comprising the following steps:
- 15 providing a primary charged particle beam;
- deflecting the primary charged particle beam away from an optical axis using a first deflection stage of a deflection system;
- deflecting the primary charged particle beam towards the optical axis using a second deflection stage of a deflection system;
- 20 redirecting the primary charged particle beam to travel substantially along the optical axis using a third deflection stage;
- focusing the primary charged particle beam on a specimen such that the specimen releases charged particles;
- 25 deflecting the specimen-released charged particles, whereby the third deflection stage is controlled such that one detection unit of two detection units is selected.
16. Method of imaging a specimen according to claim 15, whereby the first and the second deflection stages are controlled such that an aperture of a

multi-aperture unit, the aperture corresponding to a detection unit of the two detection units, is selected.

- 5 17. Method of imaging a specimen according to any of claims 15 to 16, whereby the method steps of deflection the primary charged particle beam and the specimen-released charged particles are conducted in two dimensions.
- 10 18. Multiple charged particle device, comprising
- a charged particle emitting unit (102) for emitting a plurality of primary charged particle beams (12);
- 15 a plurality of deflection systems, each comprising at least three deflection stages (14; 21; 72), whereby the deflection system is arranged for deflecting the plurality of primary charged particle beams and a plurality of specimen-released charged particles along a plurality of at least a first or a second beam paths (12a, 12b);
- 20 a plurality of at least two detection units (16; 44), each of the plurality of the at least two detection units associated with one of the plurality of primary beams and each of the at least two detection units associated with one of the at least first or second beam path so that the deflection systems are adapted to switch between the at least two detection units; and
- a multi-lens unit for focusing the plurality of charged particle beams.
- 25 19. Multiple charged particle device according to claim 18, whereby the features incorporated in claims 2 to 14 are included for each of the plurality of charged particle beams.

20. Charged particle beam device, comprising

a charged particle emitter (2) for emitting a primary charged particle beam (12);

5 a deflection system, comprising three deflection stages (14; 21; 72), whereby the deflection system arranged for deflecting the primary charged particle beam and specimen-released charged particles along a first or a second beam path (12a, 12b);

10 two detection units (16), each associated with one of the first or second beam path, so that the deflection system is adapted to switch between the two detection units; and

whereby one of the three deflection stages (14) is closer to a specimen stage (6) than the two detection units (16; 44);

15 the charged particle beam device further comprising an aperture unit (15; 41) for shaping the charged particle beam, whereby the aperture unit (15; 41) is a multi-aperture unit (15; 41) comprising two apertures (51; 42, 43);

20 whereby each aperture of the two apertures is associated with one of the first or second beam path so that the deflection system is adapted to switch between the two apertures and the corresponding detection unit of the two detection units.